# Measurement Mania

**Reporting Category** Measurement
**Topic** Estimating, measuring, and identifying equivalent measures

**Materials**

- Scale balance, weights, scale
- Rulers, measuring tapes, yardsticks, meter sticks
- Thermometers
- Measuring cups, graduated cylinders
- Recording Sheets (attached)
- Variety of different-size containers
- Items listed on recording sheets or other items available in the classroom

**Vocabulary**

*metric, U.S. Customary, length, weight, mass, temperature, capacity/liquid volume*

**Student/Teacher Actions (what students and teachers should be doing to facilitate learning)**

1. To begin this lesson, set up four stations with materials in bins or on trays labeled with the station name:
   - *Linear measurement*—Materials include rulers with metric and U.S. Customary units, yardsticks, meter sticks, and measuring tapes.
   - *Mass/weight*—Materials include balance, weights (ounces, pounds, grams, and kilograms), scale, a book, board eraser, pencil, notebook, and an apple.
   - *Liquid volume*—Materials include measuring cups with both metric and U.S. Customary units, graduated cylinders, a variety of different-size containers (such as empty bottles and jars).
   - *Temperature*—Materials include thermometers (at least one digital for body temperature), a cup of ice water, a cup of water that has been sitting outside, and a cup of water from the refrigerator.

   Students, working in groups, will need approximately 20 minutes at each station, so this lesson will take two class periods. Students should already have background knowledge about the two systems of measurement, U.S. Customary and metric.
2. Distribute the four different recording sheets (attached) to each student. Discuss the questions that appear at the top of each page. Choose one to fill out as a class. Make sure that students understand the difference in tools (devices) and units.

3. Send each group of students to one of the four stations, and give them approximately 20 minutes to complete the activities.
4. After about 20 minutes, have students clean up and put all the materials back into the bins, and have them rotate to the next station or rotate the materials.
5. As the students are working, circulate and answer questions as necessary. Students may need guidance and clarification.
6. After students have completed all stations, lead a class discussion on their findings.

**Assessment**

- **Questions**
    - What are the units of measure for length in the U.S. Customary and/or metric system? How are these units of measure related?
    - What are the units of measure for weight/mass in the U.S. Customary and/or metric system? How are these units of measure related?
    - What are the units of measure for liquid in the U.S. Customary and/or metric system? Explain how these units of measure are related.
    - What is the unit of measure for temperature in the U.S. Customary and metric system? Explain how these units of measure are related.
- **Journal/Writing Prompts**
    - Describe all the ways you could measure a puppy, including the measurement system and units of measure you would use.
    - Write a story, incorporating all of the metric (or U.S. Customary) units of measure.
- **Other**
    - Have students select an object at home to measure in length, weight, capacity, and temperature. Ask them to bring that object in and be prepared to share with the class that object's length, weight, and/or capacity.

**Extensions and Connections (for all students)**

- Have students repeat the stations, requiring them to use a different metric or U.S. Customary measure. For example, if a student used centimeters to measure lengths at the length station, require them to use meters during the second round. (Note: Be sure students realize that there is only one unit of measure for temperature in each system.)

**Strategies for Differentiation**

- Have students complete all activities with a partner, taking turns being the recorder and the measurer.
- Focus on just one system at a time during these rotations: during the first two days, measure only in metric units. For the second two days, measure only in U.S. Customary units.

# Linear Measurement Recording Sheet

**Name** _____ **Date** _____

1. What are the most common metric units of linear measurement?
2. What are the most common U.S. Customary units of linear measurement?
3. What are the most common tools used for linear measurement?

Estimate in metric and U.S. Customary units the length of each object listed in the chart below, and record your estimates in the appropriate columns. Then, measure in metric and U.S. Customary units the actual length of each item, and record the measurements in the appropriate columns.

| OBJECT | ESTIMATE OF LENGTH IN METRIC UNITS | ACTUAL LENGTH IN METRIC UNITS | ESTIMATE OF LENGTH IN U.S. CUSTOMARY UNITS | ACTUAL LENGTH IN U.S. CUSTOMARY UNITS |
|---|---|---|---|---|
| Height of a desk | | | | |
| Length of your foot | | | | |
| Width of the classroom | | | | |
| Length of a pencil | | | | |
| Width of the chalkboard | | | | |
| Length of your fingernail | | | | |
| (Your choice) | | | | |

# Mass/Weight Recording Sheet

**Name** _____ **Date** _____

1. What are the most common metric units of mass/weight measurement?
2. What are the most common U.S. Customary units of mass/weight measurement?
3. What are the most common tools used for measuring mass/weight?

Estimate in metric and U.S. Customary units the mass/weight of each object listed in the chart below, and record your estimates in the appropriate columns. Then, measure in metric and U.S. Customary units the actual mass/weight of each item, and record the measurements in the appropriate columns.

| OBJECT | ESTIMATE OF MASS/WEIGHT IN METRIC UNITS | ACTUAL MASS/WEIGHT IN METRIC UNITS | ESTIMATE OF MASS/WEIGHT IN U.S. CUSTOMARY UNITS | ACTUAL MASS/WEIGHT IN U.S. CUSTOMARY UNITS |
|---|---|---|---|---|
| Math book | | | | |
| Board eraser | | | | |
| Pencil | | | | |
| Notebook | | | | |
| Apple | | | | |
| Shoe | | | | |
| (Your choice) | | | | |

# Liquid Capacity/Volume Recording Sheet

**Name** _____ **Date** _____

1. What are the most common metric units of liquid capacity/volume measurement?
2. What are the most common U.S. Customary units of liquid capacity/volume measurement?
3. What are the most common tools used for measuring liquid capacity/volume?

Estimate in metric and U.S. Customary units the capacity/volume of each container listed in the chart below, and record your estimates in the appropriate columns. Then, measure in metric and U.S. Customary units the actual capacity/volume of each container, and record the measurements in the appropriate columns.

| CONTAINER | ESTIMATE OF CAPACITY/VOLUME IN METRIC UNITS | ACTUAL CAPACITY/VOLUME IN METRIC UNITS | ESTIMATE OF CAPACITY/VOLUME IN U.S. CUSTOMARY UNITS | ACTUAL CAPACITY/VOLUME IN U.S. CUSTOMARY UNITS |
|---|---|---|---|---|
| Soda bottle (oz.) | | | | |
| Soda bottle (ml./liter) | | | | |
| Water bottle (oz.) | | | | |
| Water bottle (ml.) | | | | |
| Baby food jar | | | | |
| Bucket | | | | |
| (Your choice) | | | | |

# Temperature Recording Sheet

**Name** _____ **Date** _____

1. What is the unit of temperature measurement called in the metric and the U.S. Customary systems?
2. What are the two scales called?
3. What is the most common tool used for measuring temperature?

Estimate in metric and U.S. Customary units the temperature of each item listed in the chart below, and record your estimates in the appropriate columns. Then, measure in metric and U.S. Customary units the actual temperature of each item, and record the measurements in the appropriate columns.

| ITEM TO MEASURE | ESTIMATE OF TEMPERATURE IN METRIC UNITS | ACTUAL TEMPERATURE IN METRIC UNITS | ESTIMATE OF TEMPERATURE IN U.S. CUSTOMARY UNITS | ACTUAL TEMPERATURE IN U.S. CUSTOMARY UNITS |
|---|---|---|---|---|
| Room temperature | | | | |
| Body temperature* | | | | |
| Ice water | | | | |
| Water from outside | | | | |
| Water from refrigerator | | | | |
| Outside temperature | | | | |
| (Your choice) | | | | |

*Be certain to sterilize the body temperature thermometer between uses.